

Remarks

The Applicants have amended Claim 12 to incorporate the subject matter of Claim 32. Claim 32 has accordingly been cancelled. Claim 12 has also been amended to clarify the semi-aromatic polyamide. The Applicants have removed the extraneous “polyamide” language adjacent to the semi-aromatic polyamide language. A similar amendment has been made to Claim 22.

Claims 12 – 13, 17 and 21 stand rejected on the grounds of non-statutory obviousness-type double patenting over Claims 5 and 10 of USPN 6,656,553. The Applicants respectfully submit that the rejection is now moot in view of the incorporation of the subject matter of Claim 32 into Claim 12. Withdrawal of the rejection is respectfully requested.

Claims 12, 13, 17, 19, 21 – 23, 27 – 29 and 31 – 37 stand rejected under 35 USC §112 as being indefinite. The Applicants note with appreciation the Examiner’s helpful comments. As noted above, the Applicants have amended both of Claims 12 and 22 so that both claims are both clear and definite. Withdrawal of the rejection is respectfully requested.

Claims 12 – 13, 17 and 21 stand rejected under 35 USC §102 as being anticipated by Nishi. The Applicants respectfully submit that the rejection is now moot in view of the incorporation of the subject matter of Claim 32 into Claim 12. Withdrawal of the rejection is respectfully requested.

Claims 12 – 13, 17, 21 – 23, 27 – 28 and 31 stand rejected under 35 USC §103 over the hypothetical combination of Oka and Shimizu with Stoeppelmann. The Applicants note with appreciation the Examiner’s detailed comments hypothetically applying the combination against those claims. The Applicants nonetheless respectfully submit that the combination is inapplicable for the reasons set forth below.

First, the Applicants respectfully submit that the rejection is now moot with respect to Claims 12, 13, 17 and 21 in view of the incorporation of the subject matter of Claim 32 into Claim 12.

The Applicants respectfully submit that the combination is also inapplicable to Claims 22, 23, 27 – 28 and 31 because, even if one skilled in the art were to make the hypothetical combination, the resulting structure would still be different from the subject matter of those claims. Claims 22 – 23, 27 – 28 and 31 provide multilayer tubes excellent in an alcohol gasoline permeation-preventing property, in interlayer adhesion, in low-temperature impact resistance, in heat resistance and in chemical resistance. These characteristics are attained by the multilayer tube comprising a layer comprising (A) polyamide 11 and/or polyamide 12; a layer consisting of (B) a semi-aromatic polyamide and, optionally, an additive, said polyamide (B) comprising a dicarboxylic acid unit containing a terephthalic acid and/or naphthalenedicarboxylic acid unit and a diamine unit containing a 1,9-nonanediamine and/or 2-methyl-1, 8-octanediamine unit (PA9T and/or PA9N); and a layer (c) comprising a fluorine-containing polymer having a functional group having reactivity with a polyamide-based resin.

In sharp contrast, Stoeppelman provides polyamide-based adhesion promoters that tightly connect fluoropolymers to polyamide. This is attained by a multilayer tube comprising a fluoropolymer inside layer; an intermediate layer comprising an adhesion promoter composition comprising a polyamide having a certain ratio of amino end groups to carboxylic end groups and an added diamine; and a polyamide outside layer.

Thus, the Applicants and Stoeppelmann have different objectives and, therefore, have different structures to achieve those objectives. Particularly, Stoeppelmann does not disclose PA9T and PA9N and requires an added diamine which is excluded by the Applicants.

Although the rejection states that Stoeppelmann teaches that the diamine may be added, but is not required (column 4, lines 19 – 27) and as such Stoeppelmann teaches embodiments that consist of the polyamide, column 4, lines 19 – 27 relates to the prior art, not to what Stoeppelmann suggests

for the Stoeppelmann structures. It is also clear from column 2, lines 53 – 65 and Claim 1 of Stoeppelmann that a diamine is required. Therefore, Stoeppelmann does not teach embodiments that consist of the polyamide.

Stoeppelmann does not teach PA9T and PA9N (see column 3, lines 34 – 55 of Stoeppelmann). However, PA9T and/or PA9N are essential in Claims 22 – 23, 27 – 28 and 31. PA9T is a semi-aromatic polyamide comprising a dicarboxylic acid unit containing a terephthalic acid unit and a diamine unit containing a 1,9-nonanediamine and/or 2-methyl-1, 8-octanediamine unit, and PA9N is a semi-aromatic polyamide comprising a dicarboxylic acid unit containing a naphthalenedicarboxylic acid unit and a diamine unit containing a 1,9-nonanediamine and/or 2-methyl-1, 8-octanediamine unit.

The enclosed Table 1 from the Applicants' specification shows a comparison between Examples 1 and 2 in which PA9T or PA9N was used as the semi-aromatic polyamide and Comparative Example 3 in which either of PA9T and PA9N was not used as the semi-aromatic polyamide, which was used in combination with C1 of a fluorine-containing polymer.

It can be seen in Table 1 that Examples 1 and 3 have significantly superior low-temperature impact resistance and sour gasoline resistance to Comparative Example 3. Thus, the selective combination of PA9T and/or PA9N (B) with a fluorine-containing polymer (C) is anything but obvious over Stoeppelmann in which PA9T and/or PA9N is not disclosed. The Applicants therefore respectfully submit that even if one skilled in the art were to hypothetically combine Shimizu and Oka with Stoeppelmann, the resulting structure would still fail to include the subject matter of Claims 22 – 23, 27 – 28 and 31. Withdrawal of the rejection is respectfully requested.

Claims 12 – 13, 17, 21 – 23, 27 – 28, 31, 36 and 37 stand rejected under 35 USC §103 over the hypothetical combination of Oka and Audenaert with Stoeppelmann. The Applicants respectfully submit that the hypothetical combination for the reasons set forth below.

First, the Applicants respectfully submit that the rejection is now moot with respect to Claims 12, 13, 17 and 21 in view of the incorporation of Claim 32 into Claim 12. Withdrawal of the rejection as it applies to those claims is respectfully requested.

The Applicants respectfully submit that the combination is inapplicable to Claims 22 – 23, 27 – 28, 31, 36 and 37 for the same reasons set forth above in the discussion associated with Stoeppelmann. In other words, even if one skilled in the art were to hypothetically combine Oka and Audenaert with Stoeppelmann, the combination would still fail to result in the Applicants' claimed combination of PA9T and/or PA9N (D) with a fluorine-containing polymer (C). Withdrawal of the rejection is respectfully requested.

Claims 19 and 29 stand rejected under 35 USC §103 over the further hypothetical combination of Krause and Oka and Shimizu with Stoeppelmann. The Applicants respectfully submit that Krause fails to cure the deficiency set forth above with the combination of Oka and Shimizu with Stoeppelmann. Withdrawal of the rejection is respectfully requested.

Claims 32 – 35 stand rejected under 35 USC §103 over the hypothetical combination of Nishi and Oka and Shimizu with Stoeppelmann. The Applicants respectfully submit that the rejection is now moot with respect to cancelled Claim 32. However, the Applicants will address the rejection as it applies to Claims 12 and 33 – 35. In that regard, the Applicants respectfully submit that the further hypothetical combination of Nishi with Oka and Shimizu fails to cure the deficiencies set forth above with respect to the combination of Oka and Shimizu with Stoeppelmann. Withdrawal of the rejection is respectfully requested.

In light of the foregoing, the Applicants respectfully submit that the entire application is now in condition for allowance, which is respectfully requested.

Respectfully submitted,



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Table 1 (excerpt)

		Example 1	Example 2	Comparative Example 3
Outermost layer	Kind	A-1	A-1	A-1
	Thickness [mm]	0.60	0.60	0.60
Intermediate layer	Kind	<u>B-1</u>	<u>B-2</u>	<u>B-5</u>
	Thickness [mm]	0.15	0.15	0.15
Inner layer	Kind	D-1	D-1	D-1
	Thickness [mm]	0.10	0.10	0.10
Innermost layer	Kind	C-1	C-1	C-1
	Thickness [mm]	0.15	0.15	0.15
Low-temperature impact resistance	[Number of reaptured tubes/number of tested tubes]	<u>0/10</u>	<u>0/10</u>	<u>5/10</u>
Fuel permeation coefficient	[g/m ² ·day]	<u>11.0</u>	<u>4.5</u>	<u>13.0</u>
Interlayer Adhesion (N/cm)	Initial	<u>49</u>	<u>45</u>	<u>3</u>
	After immersion in fuel for 1000 hours	<u>25</u>	<u>24</u>	<u>0.5</u>
Sour gasoline resistance	[Number of reaptured tubes/number of tested tubes]	<u>0/10</u>	<u>0/10</u>	<u>7/10</u>
Heat resistance	[Number of reaptured tubes/number of tested tubes]	<u>0/10</u>	<u>0/10</u>	<u>6/10</u>